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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,775	03/30/2005	Eva Marie Moser	J423-024US	2278

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EXAMINER

ARENA, ANDREW OWENS

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 12/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/529,775

Applicant(s)

MOSER, EVA MARIE

Examiner

Andrew O. Arena

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,4-8,12 and 15-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19-29 is/are allowed.
- 6) ☒ Claim(s) 1,4,5,7,8,12 and 15-18 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action:

#### ***Claim Objections***

Claim 1 is objected to because the recitations "a thickness...is 10 – 300 nm" and "a thickness of 10 – 50 %" are grammatically incorrect in that a thickness cannot be a range. An appropriate correction is "a thickness...in the range of...".

Claims 4, 5, 12, 16, 20, 21, 25, 27 are objected to because the recitation "the group comprising" defines an open set and presents an uncertainty as to the scope of the claim. If applicant intends to express alternative choices as a Markush group, the term "comprising" should be changed to "consisting of". See MPEP § 2173.05(h).

#### ***Claim Rejections - 35 USC § 112***

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites "the total proportion of all metal oxides remains below 50%" (ln 5) which is impossible and therefore renders the claim indefinite. The claim defines a layer that is 100% metal oxide: a base layer of one metal oxide - titanium oxide - mixed with another metal oxide. One correction which avoids indefiniteness would be to change the recitation in line 2 to "mixed with at least one additive metal oxide" and change the recitation in line 5 to "the total proportion of all additive metal oxides remains below...".

***Claim Rejections - 35 USC § 102***

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Nishiyama (US 6,326,670).

**Re claim 1**, Nishiyama discloses (Fig 32) composite material comprising:

a substrate (10; col 2 ln 59) that is at least heat sensitive (silicon); and

a flame protection coating (31+32; col 12 ln 66) on the substrate;

the flame protection coating comprising:

a base layer (31) of  $\text{TiO}_x$  applied on the substrate where  $1.5 \leq x \leq 1.9$  ( $\text{TiO}_x$  where  $x = 1.9$ : col 13 ln 2);

a top layer (32) of at least one of amorphous and crystalline  $\text{TiO}_2$  (col 13 ln 4) formed on the  $\text{TiO}_x$  base layer; and

wherein a total thickness of the flame protection coating is 30 nm (col 12 ln 66 – col 13 ln 1) and wherein the  $\text{TiO}_2$  top layer has a thickness of about 50% of the total thickness of the flame protection coating.

***Claim Rejections - 35 USC § 103***

Claims 1, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cuomo (US 2002/0172938) in view of Nishiyama (US 6,326,670).

**Re claim 1**, Cuomo discloses composite material (§11 ln 1-2, §12 ln 1) comprising:

a substrate (base layer: §12 ln 1-3) that is at least heat sensitive (plastic); and

a flame protection coating (as described below) on the substrate;

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the flame protection coating comprising:

a base layer of  $\text{TiO}_x$  (§12 ln 12) applied on the substrate; and

a top layer (coating: MO, §11 ln 10) of at least one of amorphous and crystalline  $\text{TiO}_2$  (§11 ln 7) formed on the  $\text{TiO}_x$  base layer.

Cuomo differs from the claimed invention in not expressly disclosing the oxygen content of the titanium oxide base layer, in not expressly disclosing the titanium oxide top layer is  $\text{TiO}_2$ , and in not expressly disclosing the thicknesses of these layers.

Nishiyama discloses (Fig 32) a  $\text{TiO}_x/\text{TiO}_2$  stack (col 12 ln 66) wherein a base layer of  $\text{TiO}_x$  has an oxygen content of  $0.7 \leq x < 2$  (col 13 ln 2) and a top layer of titanium oxide is  $\text{TiO}_2$  (col 13 ln 4) and disclose a total thickness of the flame protection coating is 30 nm (col 12 ln 66 – col 13 ln 1) and wherein the  $\text{TiO}_2$  top layer has a thickness of about 50% of the total thickness of the flame protection coating

It would have been obvious to a person having ordinary skill in the art at the time the invention was made that in the composite material of Cuomo, a base layer of  $\text{TiO}_x$  has an oxygen content of  $0.7 \leq x < 2$  and a top layer of amorphous and/or crystalline  $\text{TiO}_2$ ; at least so oxygen in the  $\text{TiO}_x$  films is inactivated (Nishiyama: col 13 ln 6-10).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made that a total thickness of the flame protection coating is 10 – 300 nm and wherein the  $\text{TiO}_2$  top layer has a thickness of about 10 - 50% of the total thickness of the flame protection coating; at least to use known suitable values.

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**Re claim 4**, Cuomo discloses that between the substrate and the base layer of the titanium oxide layer is deposited a protective layer of a metal oxide of ZnO (zinc oxide: ¶26 ln 7).

**Re claim 5**, Cuomo discloses the base layer of  $\text{TiO}_x$  is mixed (¶12 ln 14) with a metal oxide of ZnO (¶12 ln 14) and does not limit the mixing ratio.

Cuomo differs from the claimed invention only in not expressly disclosing the mixing ratio.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made that the total proportion of all [additive] metal oxides remains below 50%; at least so the titanium oxide layer remains mostly titanium oxide.

**Re claims 12 & 16**, Cuomo discloses the top layer and the base layer are doped (¶12 ln 12, 14; ¶26 ln 3, 10-11) with at least the metal oxide  $\text{MnO}_2$  (manganese oxide).

**Re claim 15**, Cuomo discloses that between the substrate and the base layer of the titanium oxide layer is deposited a protective layer of a polar adhesion (interpreted to encompass the materials listed at ¶26).

**Re claim 17**, Cuomo discloses the substrate comprises at least a polymer material (plastic: ¶12 ln 3).

**Re claim 18**, Cuomo differs from the claimed invention only in not expressly disclosing the substrate includes said coating on both of it's opposite sides.

Cuomo discloses his invention is used for detection by selective absorption on the chemically modified surfaces on the substrate, without limiting the geometry thereof.

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It would have been obvious to a person having ordinary skill in the art at the time the invention was made that the substrate has opposite sides and includes said coating on both of the opposite sides; at least to increase the detection area.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cuomo and Nishiyama as applied to claim 1 above, and further in view of Fujimori (US 2002/0108649).

**Re claim 7**, Cuomo as modified above differs from the claimed invention only in not expressly disclosing the TiO<sub>2</sub> modification anatase.

Fujimori discloses the TiO<sub>2</sub> modification anatase has a higher electron transport efficiency (¶90).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Cuomo in view of Fujimori such that at least the nine top atomic layers of the top layer of the titanium oxide layer mainly comprise the TiO<sub>2</sub> modification anatase; at least for higher electron transport efficiency.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cuomo and Nishiyama as applied to claim 1 above, and further in view of Chay (US 3,766,065).

**Re claim 8**, Cuomo disclose the substrate is a plastic substrate (¶12 ln 1-3).

Cuomo as modified above differs from the claimed invention only in not disclosing dispersed particles of metal oxide in the substrate.

Chay teaches the use of sub-micron metal oxide particles suspended in plastic which imparts flame resistance (col 2 ln 22-47).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Cuomo in view of Chay such that mixed with the substrate, are finely dispersed, sub-micron filler particles of a metal oxide; at least to impart flame resistance.

### ***Response to Arguments***

Applicant's arguments filed 09/21/2006 have been fully considered but they are all either not persuasive or moot in view of the new grounds of rejection.

Applicant's arguments regarding claim 1 and Nishiyama (pg 12) are not persuasive. Applicant has presented neither claim language nor evidence to distinguish the "heat sensitive" substrate of claim 1 from the silicon substrate of Nishiyama. Nishiyama's gate insulator discloses the claimed composition, the flame protection property is inherent. See MPEP § 2112.01(II). Nishiyama discloses a flame protection coating directly on the substrate (col 13 ln 10-12), although examiner notes that this feature is not necessary to anticipate the invention as claimed. Attorney arguments ("would not be possible") do not distinguish the claimed invention from the applied reference. See MPEP 2145(I). Applicant's arguments regarding other embodiments disclosed by Nishiyama ("up to Fig 36") are not germane to the applied rejection.

Applicant's arguments regarding Tatsumi are moot in view of the new grounds of rejection, as Tatsumi is no longer relied upon.

Applicant's arguments regarding Cuomo are not persuasive. Attorney arguments do not undermine that Cuomo in view of Nishiyama discloses all aspects of claim 1.



***Allowable Subject Matter***

Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 19-29 are allowed.

Allowable subject matter has been indicated because the references of record, alone or in combination, do not teach or suggest at least the following limitations:

“an electrically conductive intermediate layer which comprises  $\text{TiO}_x$  with an oxygen content of  $1.5 \leq x \leq 1.9$ ”, as required by dependent claim 6; and

“a base layer of  $\text{TiO}_x(\text{OH})_y$  applied to the substrate, where  $1.5 \leq x < 1.9$  and  $0.2 \leq y < 0.7$ ” and “a top layer of at least one of amorphous and crystalline  $\text{TiO}_2$  formed on the base layer”, as required by independent claim 19 and thus by claims 20-29 which depend therefrom.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

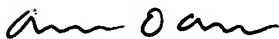
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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew O. Arena whose telephone number is 571-272-5976. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard T. Elms can be reached on 571- 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Andrew O Arena  
9 December 2006

 12/10/06

DOUGLAS W. OWENS  
PRIMARY EXAMINER